

C&K[®] Switches for Power Tools & Gardening Equipment



Appliances



Industrial



Littelfuse[®]

Expertise Applied | Answers Delivered

Many battery powered devices in very different applications share similar safety and control elements



Global power tool market statistics and drivers

Market Trends and Drivers

The global cordless power tools market is projected to grow at a compound annual growth rate (CAGR) of 7.5% from 2024 to 2028.

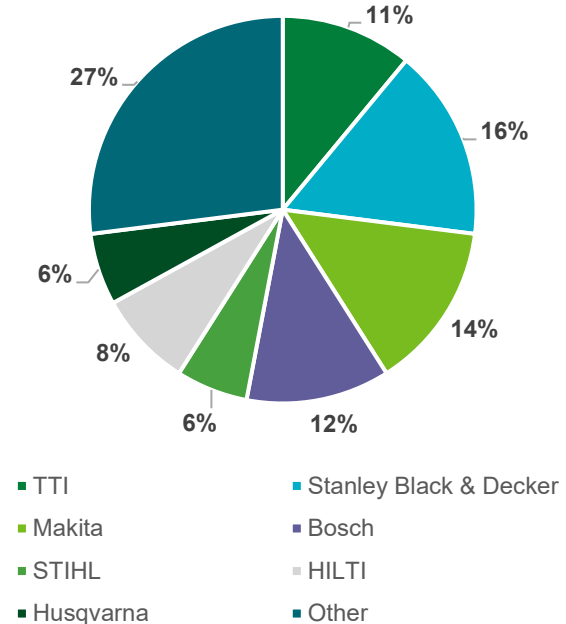
Cordless power tools dominate the market accounting for more than half of total power tool sales in 2024.

Cordless power tool architecture (i.e., control, battery management, and safety) is very similar across other battery-run devices.

Portable tools are adopting more powerful cells or different form factors. This evolution emphasizes the importance of electronic design and safety in both chargers and battery packs.

Brushless DC motors are preferred for power tools due to better reliability/longevity, smaller size, and improved output performance.

The power tool market is growing at a ~7.5% CAGR



Source: Littelfuse Estimates, [Statista](#), [alliedmarketresearch](#)

Littelfuse solutions for power tools and gardening equipment

Power charger

Fuse, MOV, TVS Diode, MOSFET, Schottky Diode



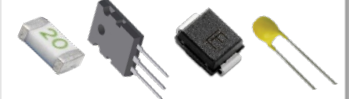
Battery management

Fuse, PPTC, Battery Protector, TVS Diode, eFuse



Motor control

Fuse, MOSFET, TVS Diode, NTC



Mode Control

Tactile, Snap-Acting, Slide Switches



Click on the link to learn more about Littelfuse solutions for 'Power Tools'



C&K® Switches for power tools & gardening equipment

Battery status indication Tactile Switch, Detect



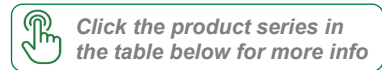
Variable speed selection Slide Switch



On/off control Snap-Acting, Rocker, Pushbutton



C&K Switches features and benefits for power tools and gardening equipment



	Switch type	Function in application	Product series	Benefits	Features
1	Tactile	Battery status indication	KSC OF , KSC2 , KSC3 , KSC4 , KSC7 , KSC2 DCT , KSC4 DCT	Reliable and repeatable haptic performance elevates end users' experience; available in a wide range of operating forces and SPDT NC-NO version available for self-diagnostic function	IP67 sealed and above; number of actuations rating; haptic selection; haptic homogeneity integration support; SPDT NC-NO version; designated 'P' UL recognized to UL/CSA C22.2
			KSE	Cost-effective and IP67 rated switches	Cost efficient; low profile; IP rating 67
	Detect		PTS526 , PTS645 , PTS841	Allow customers to choose different options to meet their product's need	Compact size; vertical or slide activation; variety of actuator lengths and actuation force
			ATS , KSC4D , SDS	Excellent performance; response to touch and feel; top or side actuation; low-profile package; normally closed version for energy savings	SPST circuit; vertical or side actuated detect switches; reliable long-time compression; overtravel ideal for detector applications
2	Snap-Acting	Actuation of the device (on/off,control)	LCS , TF , TM , ZMS , ZMA	Reliable snap-acting mechanism; compact size; ideal when space is limited	SPST NO/SPST NC/SPDT; long life and high electrical capacity (ratings up to 21 A); mounting options; sealing up to IP67
	Tactile		KSC2 DCT , KSC4 DCT	It's SPDT feature provide self-diagnostic function to the product, increase the safety level	SPDT version; designated 'PT' UL recognized to UL/CSA C22.2
	Key switch		K12S	Sealed for harsh environment applications; wide choice of travel and actuator forces	Strong tactile feedback; compact design; IP67 sealed; UL 61058-2 validated; DPST for safety
	Rocker		DF , DM	Up to 16 A switching; environmental protection; prevents accidental activation.	Power switching up to 16 A; quick connect terminals; multi-position and multi-pole function
	Pushbutton		PVA	DPST for power on/off and safety functions; wide variety of actuator heights	Compact design; DPST function for safety; long life
3	Slide	Variable speed control	OS , JS , L , AYZ	Low-profile slide switches that offer high performance	Low profile design, positive detent; RoHS compliant; IR reflow to 260 °C solder profile; versatile mounting options with choices of maintained or momentary functions; variety of actuators and terminations; AYZ: flameproof (UL94V-0 tested)
4	DIP	Motor controller	TDA , CD , RTE	Robust design with a wide range of coding options; compact size; resistance to harsh environments	Compact size, RoHS compliant; large choice of coding; vertical, right angle or reverse versions; can be compatible with washable processing

C&K® Switches KSC DCT

Tactile Switch specific highlight

Problem/Solution

Dual Circuit Technology refers to a feature that creates two independent output signals inside the body of one tactile switch—Single Pole Double Throw (SPDT). See below SPDT circuitry. The KSC DCT tactile switch has a Common pin, a Normally Close (NC) and a Normally Open (NO) Pin. If the customer chooses to use both NC and NO circuitry, it provides a Changeover signal and allows the customer to use both circuitries to define the logic of the signal, and take actions based on the defined logic.

In an automotive door handle as an example, both NC and NO circuitries are used before making any decision. The logic is at rest, the NC contact is closed while the NO contact is open. When a user pushes the button, nothing will happen until the NC contact is opened, and the NO contact is closed.

Technical resources *(Click on below icons to learn more)*



Series Page



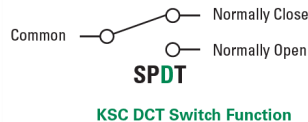
Datasheet



Product Brief

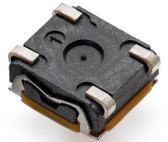


Application Note



Benefits

- Designated 'P' UL recognized to UL/CSA C22.2
- Enhanced functionality: enable more complex control schemes, enhance the user experience and the functionality of the device
- Versatility: a single input can be connected to one of two outputs, control multiple circuits or functions from a single switch
- Compact design: with its 6x6 mm footprint saves space, crucial in compact devices
- Reliability: ensuring reliable and precise operation Important in applications where accurate control is critical
- Simplified circuit design: using an SPDT switch can reduce the number of switches and wiring needed in a circuit, reducing the cost and complexity of the circuitry



Markets/applications

- Automotive applications
- Medical devices
- Consumer electronics
- Industrial equipment



C&K® Switches ZMA Snap Switch specific highlight

Problem/Solution

Achieving high-reliability detection in a compact form factor is a common requirement across multiple industries. Designers face challenges incorporating switches that offer both precise operation and flexibility in small spaces. The ZMA switch addresses these challenges by providing a highly reliable and precise SPDT snap-acting mechanism. Its small form factor, combined with flexible mounting options and compatibility with multiple levers, makes it easy to integrate into various designs from both mechanical and electrical perspectives.

Technical resources:



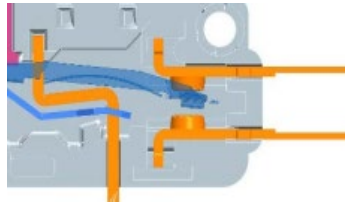
Series Page



Datasheet



Tech Info



Features

- SPDT snap acting mechanism
- Small form factor with two mounting holes
- Compatibility with multiple levers for mechanical adjustments
- RoHS compliant



Benefits

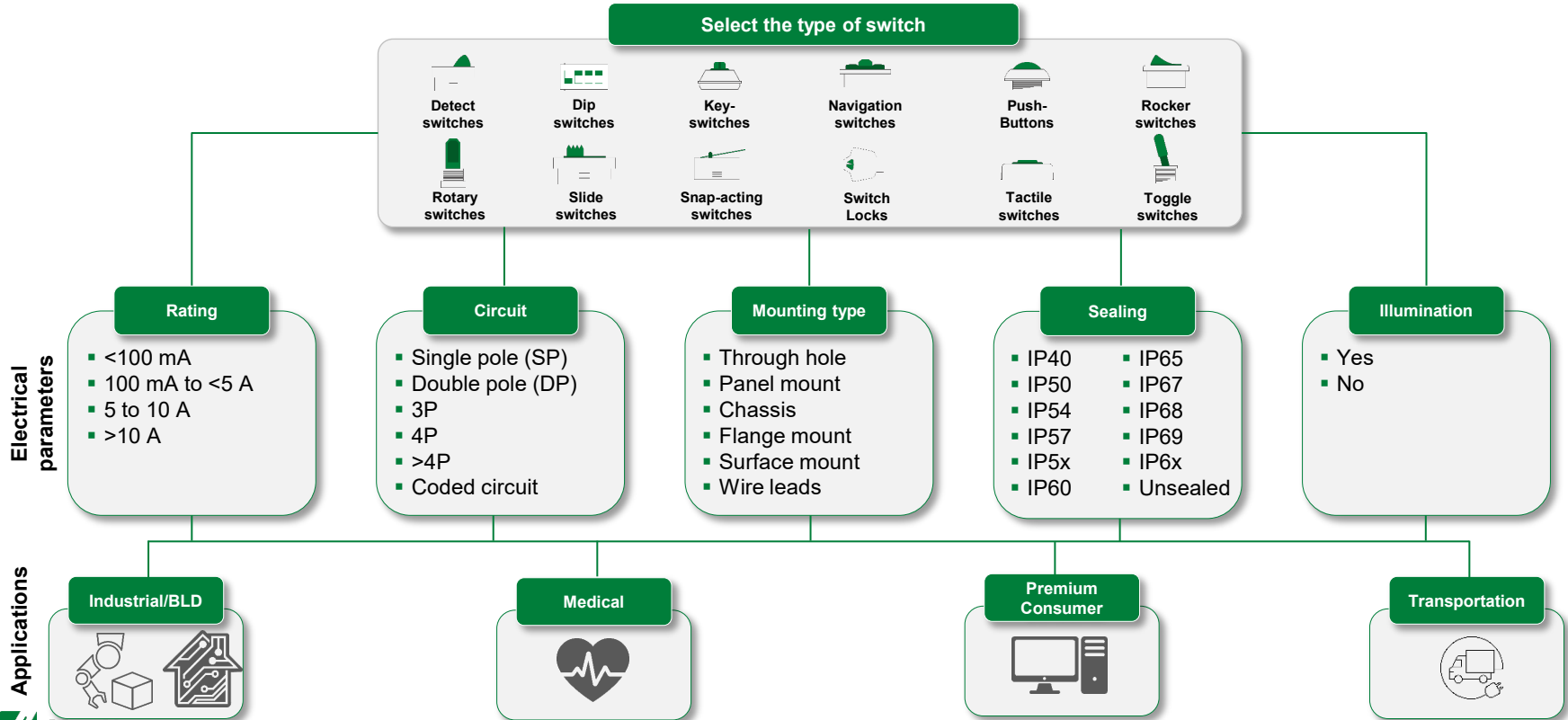
- High Reliability | high precision snap acting mechanism
- Multiple electrical ratings from 0.1 A up to 3 A
- Easy to integrate, multiple mounting configurations
- Simplified integration with C&K providing a comprehensive harness solution
- Cost-effective solution on a high-performance mechanism
- UL recognized solution

Markets/applications

- Transportation (glove, mirror, and bin detection)
- Transportation (seat detection)
- Consumer (end of travel detection)
- Consumer (lid position detection)



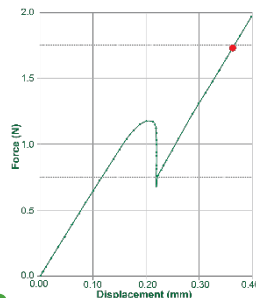
Selecting a Switch



C&K customization expertise

Enhance user experience

- Customized Haptic Switches
 - Desirable appearance, feel & sound
- Decorative solutions
 - Custom graphics, logos, & textures
- Lighting
 - Backlight accenting & light piping to enhance your product appearance

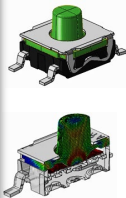


Design & manufacturing tools

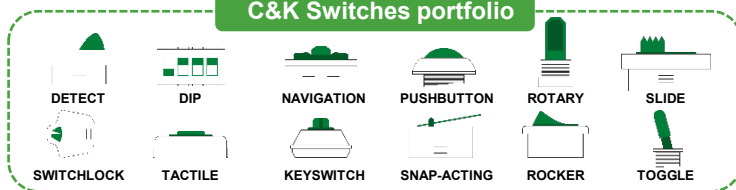
- 3-D CAD modeling
- Mold flow analysis
- FEA
- Dynamic motion analysis
- High-speed photography
- Fixed & dynamic X-ray
- Thermal imaging
- SEM/FTIR
- Sound chamber and force/displacement tester

Value added services

- Designing switches into modules & assemblies
- Multi-function & multi-axis switching
- Integrating switches and electronics
- Provides wire harnesses, terminated wires, integrated connectors, or header pins



C&K Switches portfolio



Quality & reliability

- Develop & manufacture sealed switches to meet either IP67 or IP68 standard
- Harsh environmental compatibility
- Sweat resistance testing
- SO2 and SO4 gas testing



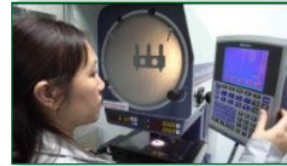
Design products to meet customer requirements for haptic touch, look, sound, & other unique features



C&K manufacturing excellence

Dole, France

- Vertically integrated, R&D (400 employees, defect rate < 0.5ppm)
- Proprietary equipment & methods
- Custom molds, dies & assembly machines
- Quality certifications (ISO 9001:2008, ISO 14001:2004, ISO 50001, TS 16949:2009, ESCC - MIL-NASA)



Huizhou, China

- Vertically-integrated, R&D capabilities (800 employees, 60 lines, defects rate < 2ppm)
- Auto-assembly & Auto-inspection machines (80 sets, 90% In-house designed, cycle time 0.8s to 2s)
- Quality certifications (ISO 9001:2008, ISO 14001:2004, TS 16949:2009)

Workshops

- 90% tooling designed and manufactured internally
- Stamping Workshops (Dole and Huizhou)
- Molding Workshops (Dole and Huizhou)
- Plating Workshops (Dole)
- Assembly Workshops (Dole and Huizhou)



Hung Yen, Vietnam

- Built in 2019 (47 lines, 250 employees, and defects rate < 2ppm)
- Manual assembly lines with semi-automated machines and tools (Cycle time 2s, lean work cells, in-line QA processes)
- Quality certifications (ISO 9001:2015)

Striving for complete customer satisfaction through state of art manufacturing facility & defect free performance



Additional information can be found at [Littelfuse.com](https://www.littelfuse.com)

Explore the world of Littelfuse products and applications with ecatalogs (ecatalogs.littelfuse.com)

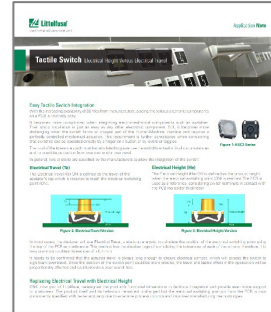
Click the images for more information



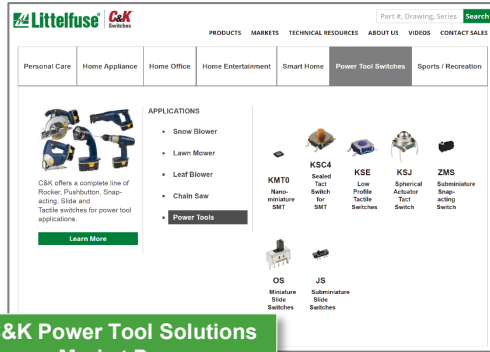
C&K Switches Selection Guide



KSC DCT Series Tactile Switch Application Brief



Electrical Height Vs. Electrical Travel App Note

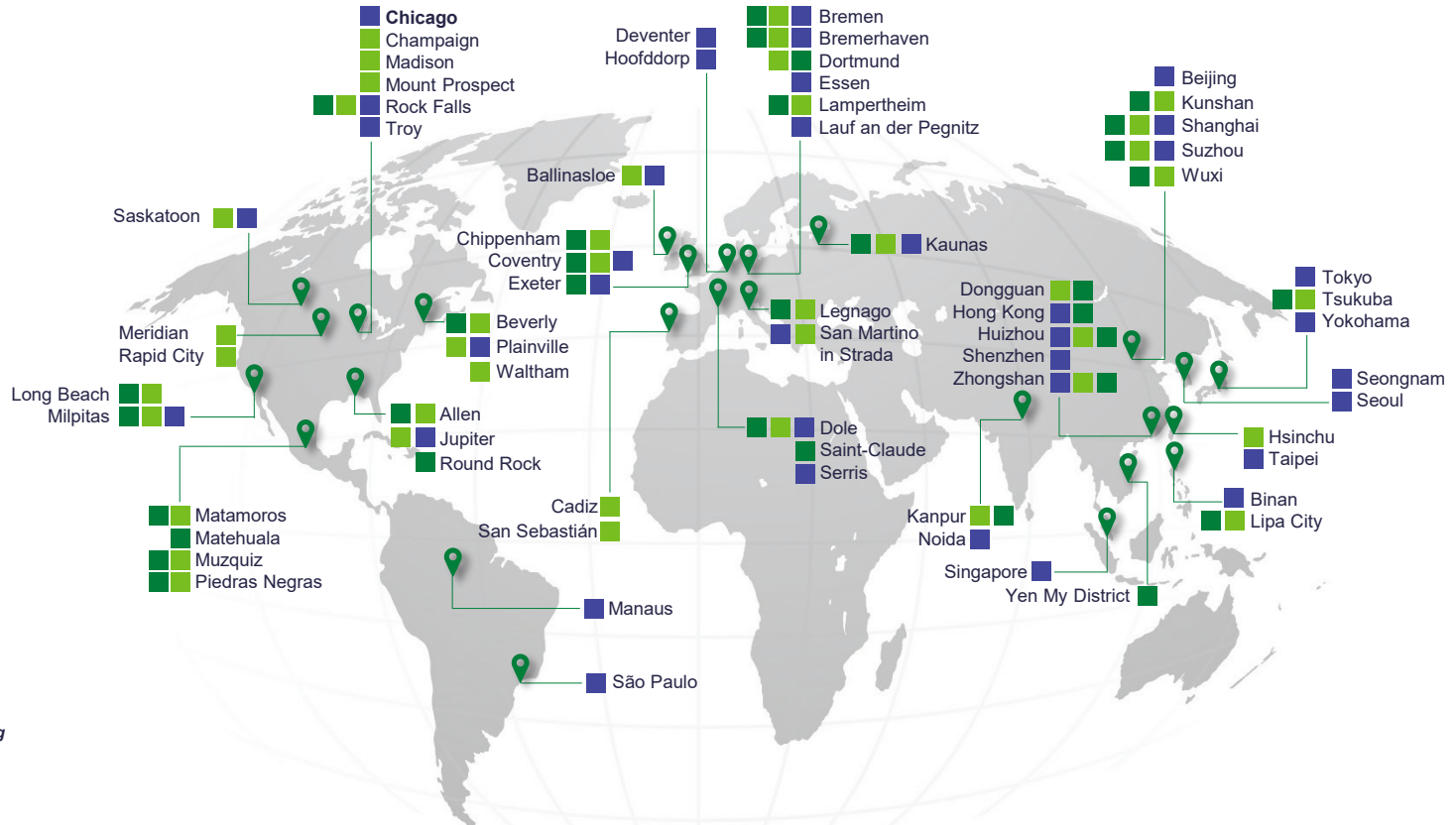


C&K Power Tool Solutions Market Page



Scan me

Local resources supporting our global customers



Legend

- Sales
- R&D
- Manufacturing

Partner for tomorrow's electronic systems

Broad Product Portfolio

We are an industrial technology manufacturing company empowering a sustainable, connected, and safer world.

Testing Capabilities

We help customers get products to market faster, and we offer certification testing to global regulatory standards.

Application Expertise

Our engineers partner directly with customers to help speed up product design and meet their unique needs.

Global Customer Service

Our global customer service team is with you to anticipate your needs and ensure a seamless experience.

Global Manufacturing

Our high-volume manufacturing is committed to the highest quality standards.

Compliance and Regulation

We help customers during the design process to consider requirements set by global regulatory authorities.





Expertise Applied | Answers Delivered

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